What is a Reference Design?

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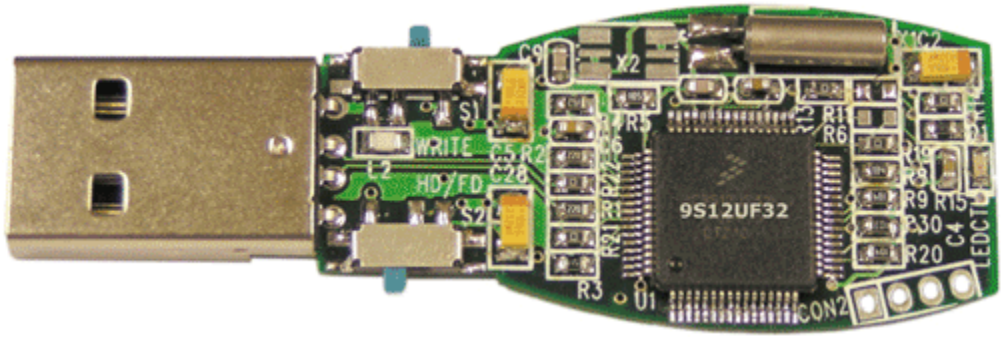
Facets of a Reference Design

- **Hardware**
  - Cell phone, GPS, meter, thermostat, ATM
- **Software**
  - Word processor, spreadsheet, customer information system, billing application, ATM
- **Networks**
  - Internet, phone, cellular, ATM
- **Information and Transactions**
  - EDI, POS, ATM

EXAMPLES OF SUCCESSFUL REFERENCE DESIGNS

- Cell Phone
- Personal Computer
- Point of Sale Terminals
- Automatic Teller Machines
- USB Thumb Drive



CELL PHONE EXAMPLE

- It looks like a cell phone
- Everyone knows how to use it
- Multiple vendors make them and they work on multiple vendors networks
- There is a clear business model among all of the interoperable pieces of the system

Cable Example – System Level

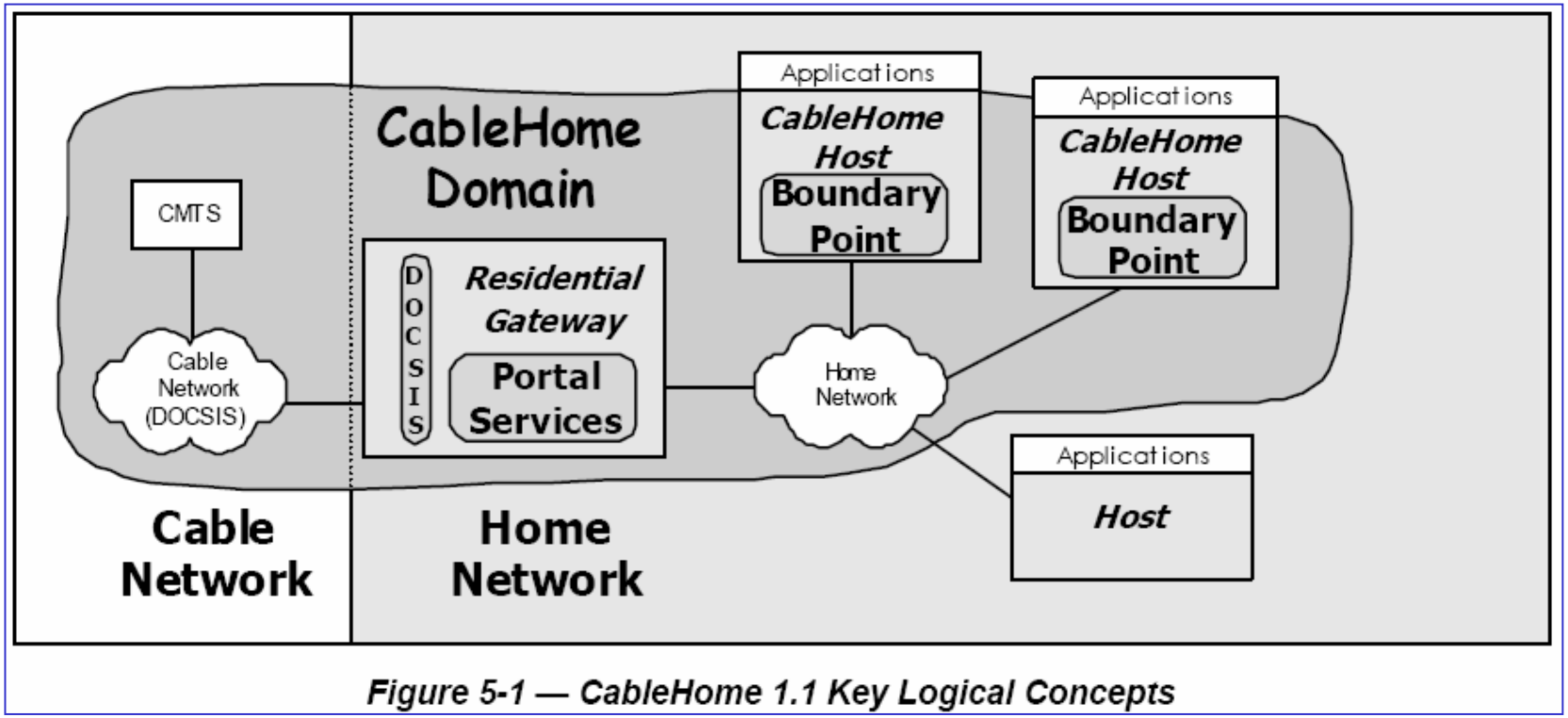


Figure 5-1 — CableHome 1.1 Key Logical Concepts

Cable Example – Device Level

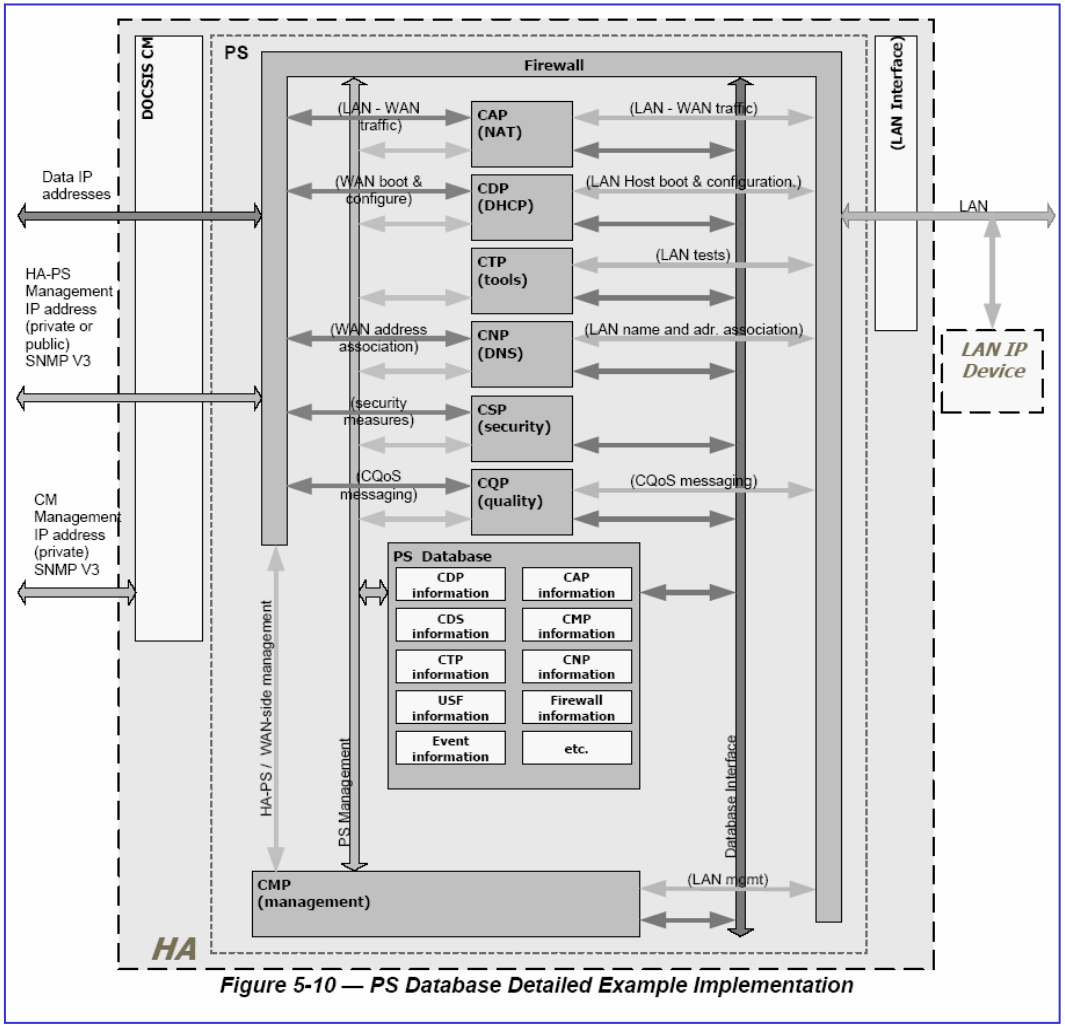


Figure 5-10 — PS Database Detailed Example Implementation

Cable Modem Evolution

Vendor Lock-In *(proprietary systems)*

Standards Formation

Heterogeneous Solutions *(DOCSIS best of breed & low cost)*

1992 — 1996 — 2001 — 2004

LANcity (Nortel) *CM Proprietary → CM DOCSIS*

Cisco Systems *(DOCSIS reference design partners)*

- Toshiba, Philips,...

Com21 *CM Proprietary*

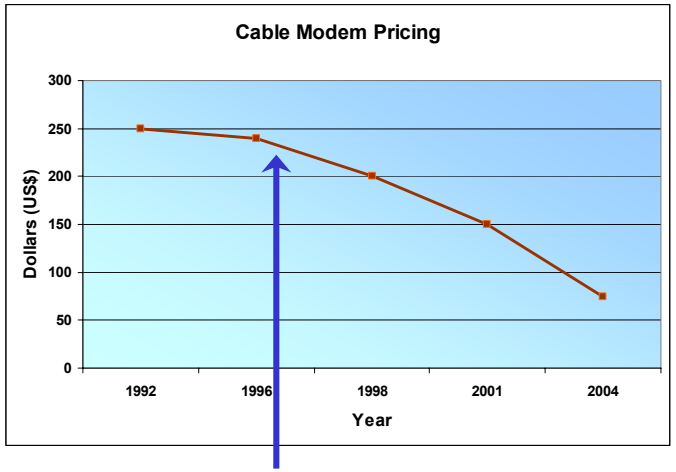
Terayon *CM Proprietary*

Zenith *CM Proprietary w/ Telco Return*

Motorola *Cable Infrastructure, STB, CM Proprietary*

General Instruments *Cable Infrastructure, STB, CM Proprietary w/ Telco Return*

Hewlett-Packard *CM Proprietary → exited market in 1996*



DOCSIS Standards Initiative Started

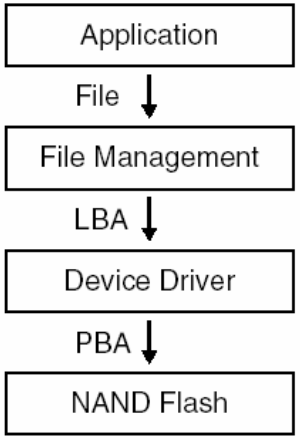
Lessons Learned by Cable MSOs

- **Proprietary hardware and software solutions that extend between the back-office infrastructure and customer premise equipment always results in vendor lock-in**
  - The Cable Industry's DOCSIS initiative has delivered standards-based broadband cable networking products & systems, resulting in heterogeneous data networks
  - Motorola and Scientific Atlanta still have an industry duopoly hold on analog & digital set-top boxes and their head-end devices & systems (OpenCable should change this in 2007)
- **Cable networking standards need to be driven by cable operators, not the vendor community – reason for CableLabs (www.cablelabs.com)**
- **Standards are critical for allowing customers access to best-of-breed products and technologies at ever lowering price points, and prohibit vendor lock-in**
- **Vendor compliance testing & certification is critical to enabling retail market for customer in-premise cable networking products**

Thumb Drive Reference Design

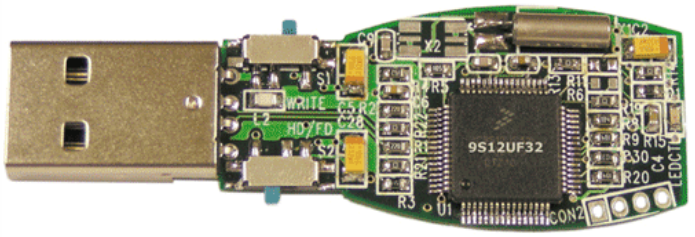
Thumb Drive Logical Format

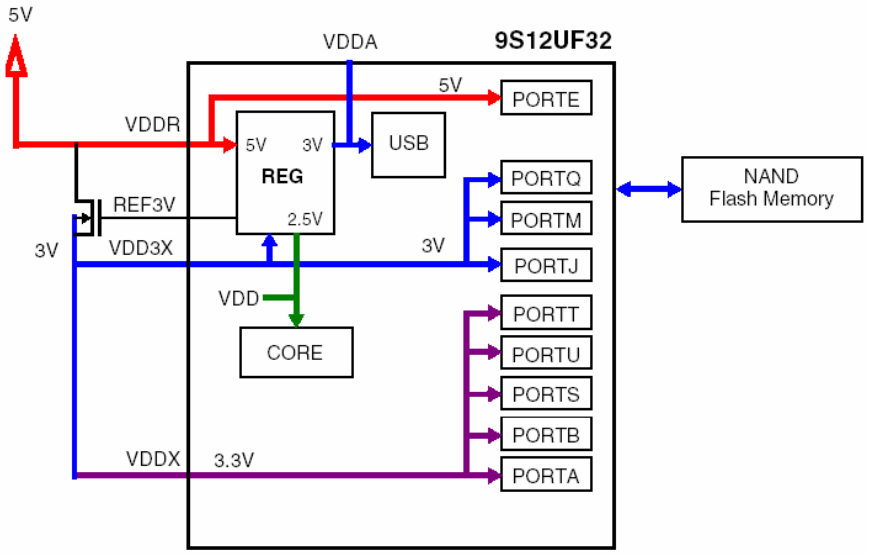
- Partition Boot Sector (Sector size, Cluster size, Total Cluster, etc.)
- File System Management (FAT16)
- LBA Concept
- Master Boot Sector (MBR)
- FAT1, FAT2
- Root Directory



Thumb Drive Physical Format

- Card Information Structure
- Zone Boundary Concept
- Logical Block Address (LBA)
- ECC Area





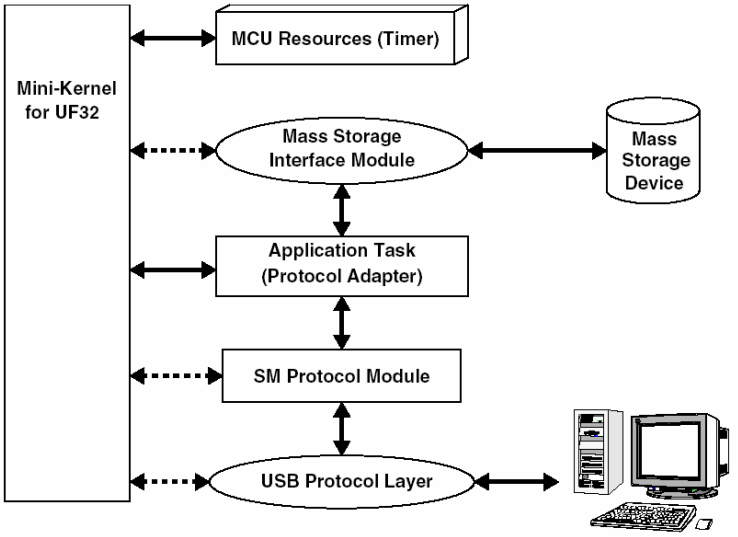


Figure 4-1. System Software Architecture

Intel Example

- **NEW ORLEANS, May 6, 2002 -- Intel Corporation is demonstrating the Intel® Media Center Reference Design at the National Cable and Telecommunication Association (NCTA) Annual Convention in New Orleans. This reference design is intended to help hardware and software developers accelerate the development and production of powerful, scaleable, interactive consumer products that integrate the capabilities of a number of previously discrete devices.**

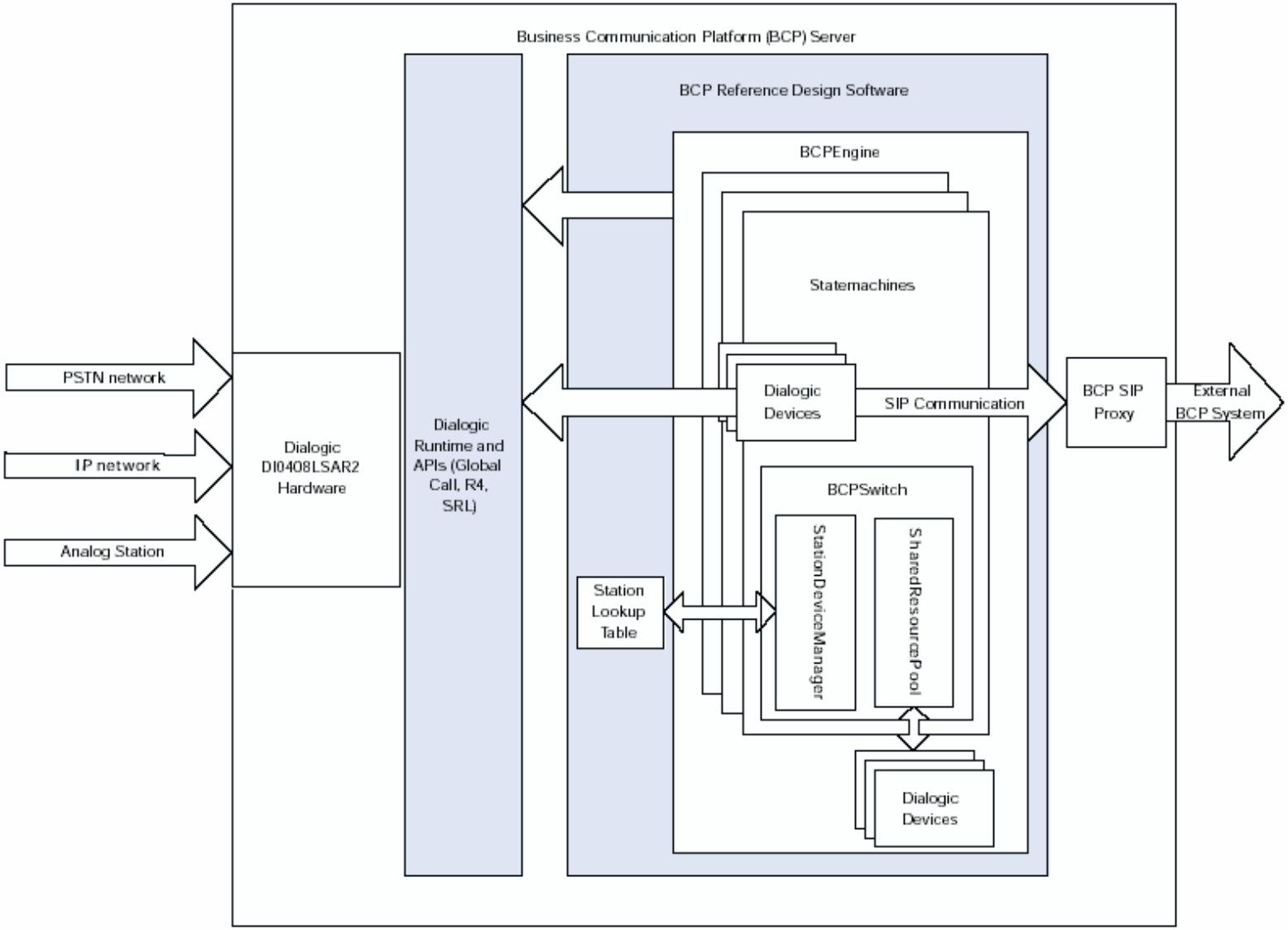
Reference Design Document Outline

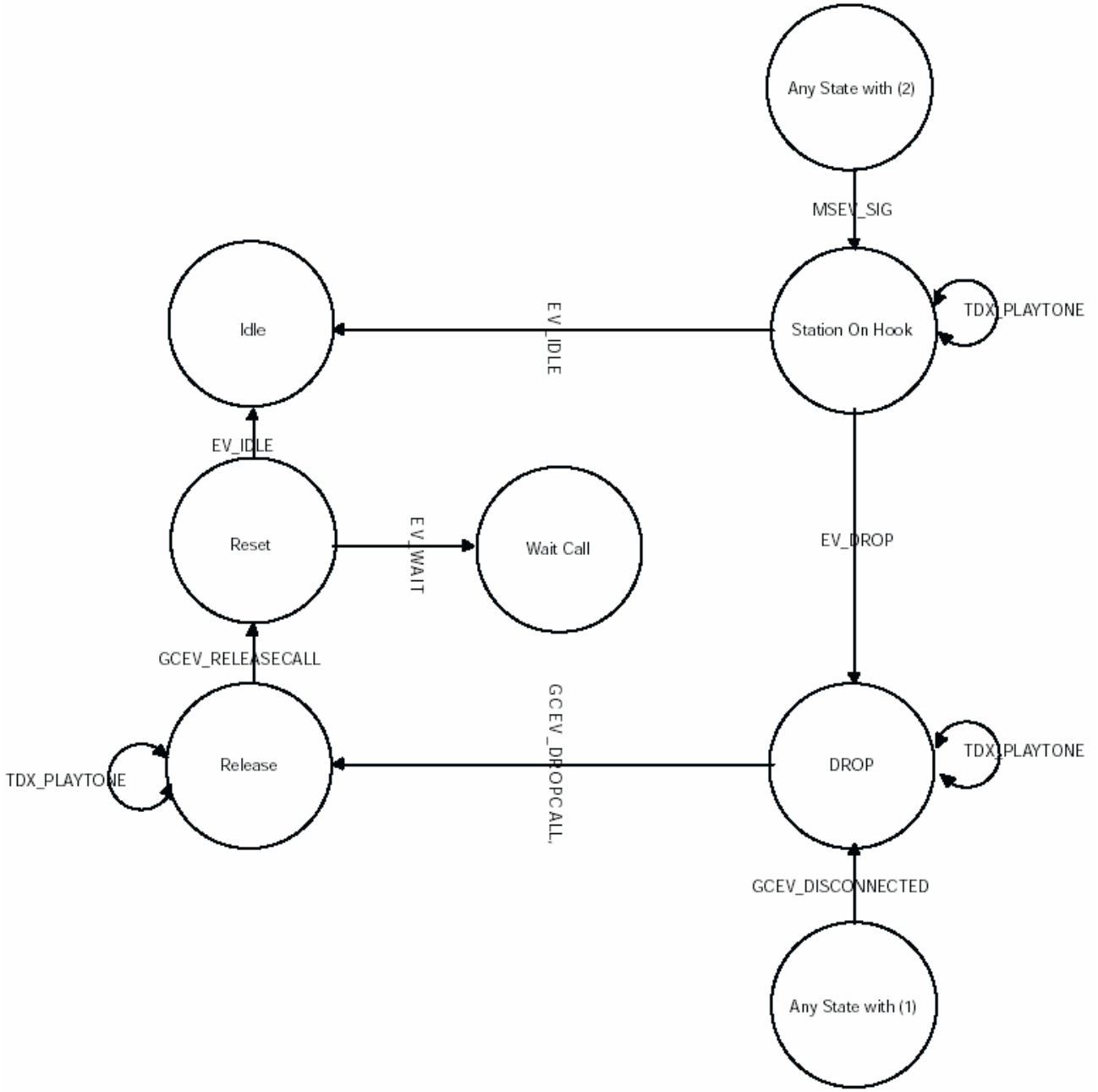
- Overview
- Market Segment Opportunities
- Market Segment Success Factors
- Cost
- Users
- Solution Configurations
- Communication Building Blocks

Outline (continued)

- **Configuration Overview**
  - Equipment resources
  - Configurations
    - Standalone
    - Interconnected
  - Reference Application Scenarios (use cases)
  - Flow Diagrams
- **Hardware Components**
- **Software Components**
- **Third Party Components**

http://www.intel.com/network/csp/pdf/8770rd.htm


Business Communication Platform (BCP) Server
BCP Reference Design Software
BCPEngine
Statemachines
PSTN network
IP network
Analog Station
Dialogic DI0408LSAR2 Hardware
Dialogic Runtime and APIs (Global Call, R4, SRL)
Dialogic Devices
SIP Communication
BCP SIP Proxy
External BCP System
BCPSwitch
StationDeviceManager
SharedResourcePool
Station Lookup Table
Dialogic Devices


Any State with (2)
MSEV_SIG
Idle
EV_IDLE
Station On Hook
TDX_PLAYTONE
EV_IDLE
Reset
EV_WAIT
Wait Call
EV_DROP
GCEV_RELEASECALL
Release
TDX_PLAYTONE
GCEV_DROPCALL
DROP
TDX_PLAYTONE
GCEV_DISCONNECTED
Any State with (1)

Purpose for Intel's Reference Design

- Reduce the barrier of entry to implementing a specific solution by publishing the reference design
- Manufacturers respond by building systems that use more chips
- Intel sells more acres of silicon